

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**  
**BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re Application of:	§	Group Art Unit: 2193
Debjit Das Sarma	§	
	§	Examiner: Ngo, Chuong D.
Serial No. 10/730,800	§	
	§	Atty. Dkt. No.: 5500-97400
Filed: December 9, 2003	§	
	§	
	§	
	§	
	§	
For: Apparatus and Method for	§	
Multiple Pass Extended Precision	§	
Floating Point Multiplication	§	
	§	
	§	

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Anthony M. Petro

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/Anthony M. Petro/

Signature

December 29, 2008

Date

**REPLY BRIEF**

**Mail Stop Appeal Brief - Patents**  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir/Madam:

This brief is in reply to the Examiner's Answer mailed October 29, 2008. Appellants respectfully request that this Reply Brief be entered pursuant to 37 C.F.R. § 41.41 and considered by the Board of Patent Appeals and Interferences.

## **REPLY**

The Examiner rejected claims 1-22 under 35 U.S.C. § 101, alleging that the claims are directed to non-statutory subject matter. Appellant respectfully traverses these rejections for at least the reasons given in Appellant's Appeal Brief filed August 18, 2008. In addition, Appellant's responses to particular portions of the Examiner's Answer are given below.

### **Claims 1-9:**

Appellant previously argued that, unlike in *Benson*, the subject matter of claim 1 is tied to a specifically recited apparatus. **In the Examiner's Answer**, the Examiner argues that

[a] particularly claimed combination of elements performing [a] particularly claimed combination of calculations, or reciting a specific machine that perform[s] a calculation is not sufficient for the invention to be statutory. . . . For a claimed invention to constitute a practical application, the claims must recite a practical application for the invention to produce a useful, concrete and tangible result or to transform an article or physical object to a different state or thing.

Examiner's Answer at 5-6.

After the mailing of the Examiner's Answer, the Court of Appeals for the Federal Circuit decided *In re Bilski*, which specifically abrogated the "useful, concrete and tangible result" test of *State Street* and *Alappat* as a sufficient test for the subject matter eligibility of process claims. *In re Bilski*, Slip Op. at 20, n.19 (Fed. Cir. October 30, 2008). Appellant notes that while *Bilski* specifically addressed only the issue of process or method claims, a claim directed to one of the other statutory categories that nevertheless satisfies the same requirements as set forth for process claims in *Bilski* ought to satisfy the requirements of 35 U.S.C. § 101.

The *Bilski* court noted that

[t]he Supreme Court . . . has enunciated a definitive test to determine whether a process claim is tailored narrowly enough to encompass only a particular application of a fundamental principle rather than to pre-empt the principle itself. A claimed process is surely patent-eligible under § 101 if: (1) it is tied to a particular machine or apparatus, or (2) it transforms a particular article into a different state or thing.

*Bilski*, Slip Op. at 10. The court further clarified that “a claim that is tied to a particular machine . . . does not pre-empt all uses of a fundamental principle in any field but rather is limited to a particular use, a specific application. Therefore, it is not drawn to the principle in the abstract.” *Id.* at 16 (emphasis added).

Appellant notes that the subject matter of claim 1 does not merely recite abstract algorithmic operations, but instead recites the structure of an apparatus with particularity. Claim 1 is directed to a circuit that comprises specifically recited circuit structures coupled in specifically recited ways. More particularly, claim 1 recites partial product generation logic, a plurality of carry save adders coupled to the partial product generation logic, and a first carry propagate adder coupled to the carry save adders.

That the structure of claim 1 does not pre-empt an underlying principle of multiplication is evident from the fact that the recited structure is not the only possible structure that is capable of producing a floating-point multiplicative product. For example, the same arithmetic result that is produced by the operation of the circuit of claim 1 could be implemented entirely in software by a processor that does not include the recited partial product generation logic, carry save adders, or carry propagate adder configured as recited in claim 1.

Appellant respectfully submits the subject matter of claim 1 is facially tied to a particular machine or apparatus and does not pre-empt a fundamental principle. Following the guidance of *Bilski*, Appellant submits that for at least the foregoing reasons, the subject matter of claim 1 and its dependent claims is directed to statutory subject matter as required by 35 U.S.C. § 101.

**Claims 10-15:**

As previously noted by Appellant, claim 10 differs from claim 1 in that claim 10 is a method claim directed to a method of operation of a multiplier circuit. The method of claim 10 recites each of the functional attributes of the multiplier circuit of claim 1, phrased as actions that are performed by the explicitly-recited multiplier circuit. **In the Examiner's Answer**, the Examiner contends that claim 10 is "not directed to a specific apparatus . . . . Indeed, claims 10-15 are clearly directed to a method for performing multiplication." Examiner's Answer at 7. Appellant respectfully disagrees with the Examiner's contention, in that while it is true that claim 10 recites method actions, it specifically limits the performance of those actions to a particular type of apparatus: a multiplier circuit.

By its ordinary definition, a "circuit" is "an assemblage of electronic elements," which are necessarily a particular type of apparatus. Electronic elements are distinct from mechanical elements that do not require electricity for their operation. Thus, it is simply not the case, as asserted by the Examiner, that "[a]ny and every device including a computer or a calculator used to implement[] the method" would infringe claim 10. *Id.* As demonstrated by Charles Babbage's 19<sup>th</sup>-century designs, it would be entirely feasible to construct a mechanical computer or calculator that could perform multiplication operations that are mathematically equivalent to those encompassed by claim 10. However, such a mechanical apparatus would not constitute a circuit, and therefore would not infringe claim 10.

Whether or not such a mechanical implementation of the method of claim 10 would be practical is immaterial to the requirements of statutory subject matter. The doctrine of pre-emption is intended to protect "[p]henomena of nature, . . . mental processes, and abstract intellectual concepts," because these "are the basic tools of scientific and technological work." *Gottschalk v. Benson*, 409 U.S. 63, 67 (1972). But claim 10 does not rise to this level of abstraction. Instead, it recites no more than any

patentee has a right to claim: the exclusive right to use and to prevent others from using, for a limited time, a specific method that is tied to a particular sort of apparatus, where the recited apparatus does not encompass every possible apparatus that might be used to practice the method.

For at least the foregoing reasons, Appellant therefore submits that claim 10 and its dependent claims are directed to statutory subject matter as required by 35 U.S.C. § 101.

**Claims 16-22:**

Claim 16 is similar to claim 1 in that both claims are directed towards specifically recited configurations of apparatus elements. Claim 16 is directed to a microprocessor comprising specific hardware elements: dispatch logic configured to issue multiply instructions to a floating-point unit; and a floating-point unit coupled to the dispatch logic. The recited floating-point unit is configured to implement the same functional elements as the multiplier circuit of claim 1.

Appellant notes that for reasons similar to those given above for claim 1, the apparatus of claim 16 is a particular apparatus to which the claim is specifically limited. As previously noted by Appellant, it is entirely possible to implement the functionality of claim 1 via software in a computing system that lacks the hardware features specifically recited in claim 1. Similarly, the functional features of claim 16 could conceivably be implemented by software in a system that lacks one or more of the hardware features of claim 16, such as the recited dispatch unit configured to issue multiply instructions, or the recited floating-point unit. Indeed, numerous examples exist of microprocessors lacking hardware floating point functionality (e.g., Intel x86 processors prior to the 80486, Texas Instruments C6400 integer-only digital signal processors, etc.). Such implementations would not infringe claim 16, yet could produce results equivalent to those of claim 16. Therefore, claim 16 cannot be said to pre-empt an underlying principle or algorithm.

For at least the foregoing reasons, Appellant submits that claim 16 as well as its dependent claims are directed to statutory subject matter as required by 35 U.S.C. § 101.

## CONCLUSION

For the foregoing reasons, it is submitted that the Examiner's rejection of claims 1-22 was erroneous, and reversal of this decision is respectfully requested.

The Commissioner is authorized to charge any fees that may be due to Meyertons, Hood, Kivlin, Kowert, & Goetzel, P.C. Deposit Account No. 501505/5500-97400/AMP.

Respectfully submitted,

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